Flexible pipeline increases ship channel safety for dustpan dredge operations during marsh creation (Part 1)

Part 1 of a two-part series to be concluded in Dredging Research, Vol 5, No. 4, Dec. 2002. Material provided by ERDC Vicksburg, New Orleans District, and Louisiana state agency personnel, Elke Briuer, APR, editor

Louisiana's coastline is changing dramatically as it loses more than 75 km^2 of marshes and coastal lands each year. Innovative methods for restoring such areas include placement of dredged material removed to maintain navigation for marsh construction and rehabilitation.

In the past, during maintenance work on the lower Mississippi River, cutterhead dredges with pipeline discharge were used to create marshes in the Head of Passes at a reasonable cost. However, cutterhead dredges have limited maneuverability and are a hazard to large ships navigating through the restricted channel. Marsh creation with cutterhead dredges was discontinued at the Head of Passes to maintain navigation safety in the channel, although they are still in such use in Southwest Pass between Head of Passes and the jettied channel. Hopper dredges now maintain the ship channel in the lower portions of the Mississippi River above Head of Passes because their mobility allows safe navigation. However, material removed by hopper dredges is not used to create marsh. In order to use material removed by a hopper dredge for marsh creation, sediments must be directly pumped out of the hopper as it is tied to a buoy or barge. Dredge maneuverability decreases when the vessel is tied to a barge, a safety concern, and direct pump-out increases the cost of hopper dredging as it takes more time, a negative economic impact. Furthermore, during periods of rapid shoaling, it is imperative that the hopper dredges maintain high production rates in order to keep the channel open to ship traffic. Maintaining high production is not possible with prohibitively time-consuming pump-out operations.

Dustpan dredges are used routinely on the lower Mississippi River above Head of Passes to maintain the navigation channel. Dustpans are hydraulic dredges that use a wide, flat dredge head assisted by water jets (see online animation, *http://www.wes.army.mil/el/dots/doer/tools.html*) to dredge the free-flowing, cohesionless sediments found in the Mississippi River. Most dustpan dredges are self-propelled, assisted by two bow anchors, and have sufficient mobility for required safe passage of traffic on the lower Mississippi. These dredges have high-volume, low-pressure pumps capable of pumping dredged material to distances of approximately 300 m (900 ft) through rigid pipelines, allowing placement of sediment in shallow portions of the river. This distance, however, is not sufficient to reach the marshes.

For marsh creation in the Head of Passes, the ideal dredge must

- operate efficiently and economically
- have sufficient maneuverability in and out of the restricted navigation channel to allow safe passage to other vessels
- be able to pump dredged material in excess of 300 m (900 ft) (often, distances of up to 3,000 m (10,000 ft) are required to place material in a marsh), and
- have a flexible pipeline that allows the dredge to quickly move into, out of, and across the channel.

As noted above, there is a strong desire to use sediments dredged for navigation beneficially for marsh creation in southern Louisiana; however, at Head of Passes, navigation safety, economics, and maintaining authorized channel depth are major considerations. A potential solution at this location is a dustpan dredge with a unique, flexible pipeline which gives the dredge the maneuverability that is lacking with the cutterhead dredges, and other modifications that would meet the requirements outlined above.

To verify this hypothesis, the U.S. Army Corps of Engineers' New Orleans District, with the State of Louisiana as the primary sponsor, proposed a demonstration in the lower portion of the Mississippi River, at the Head of Passes in June 2002. The work was collaborated by scientists and engineers of the Corps' research facility, ERDC, Vicksburg, Miss. The DOER program's focus on identifying and demonstrating emerging dredging and dredged material management technologies in cooperation with field offices provided an ideal fit for this demonstration project.

Dustpan demonstration

The contractor-owned dustpan dredge *Beachbuilder* was provided for the demonstration. The *Beachbuilder* is a nonself-propelled dustpan with a total pumping capacity of 10,000 hp, designed primarily for beach nourishment projects on the east coast. A tug connected to the stern of the *Beachbuilder* provided additional maneuverability for the dredge on this project.

Dredging operations were modified by using a two-wire/anchor lines positioning system ("upstream" forward port and starboard) instead of the usual six-wire/anchor lines (forward and aft). Minimizing the anchor lines allowed the dredge to maneuver in and out of the channel more easily. These anchors were placed outside the navigation channel template on the right and left descending bank sides, upstream of the dredge.

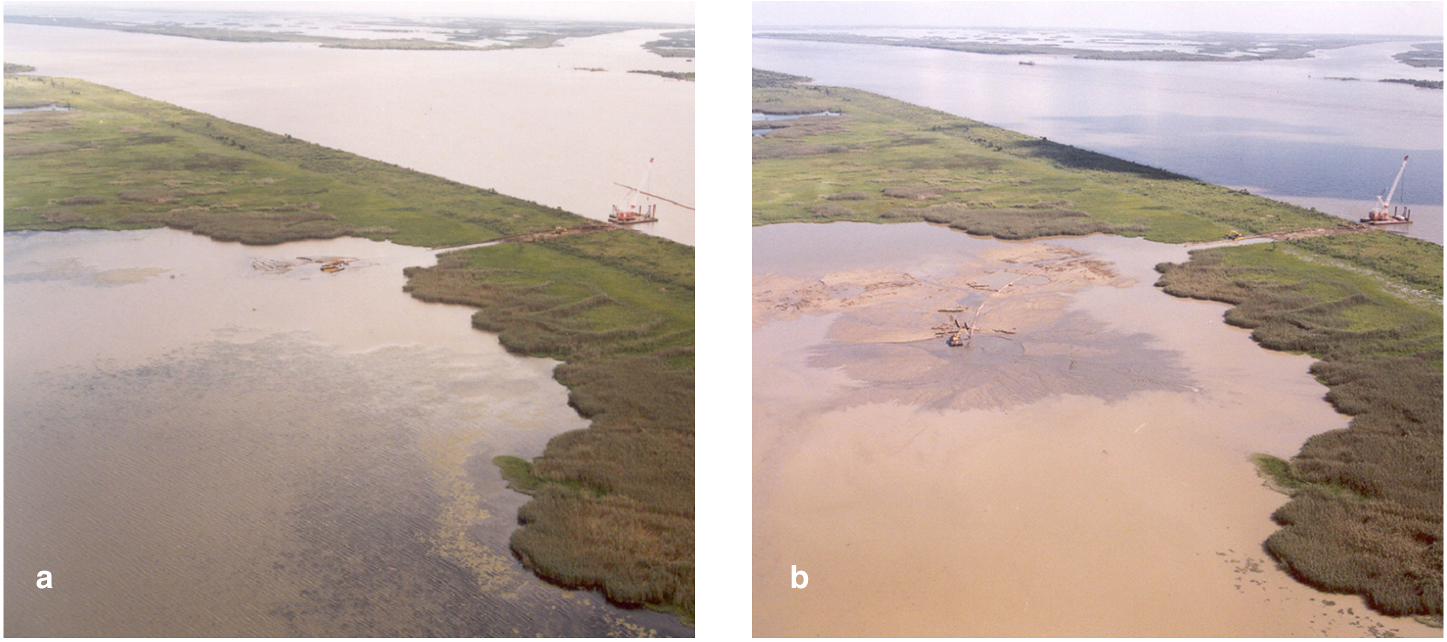
Additionally, the *Beachbuilder* was to discharge the dredged material through a flexible, floating hose connected to a "hard point," an anchored transition point from the floating hose to a submerged line in the river. This line was, in turn, connected to a pipeline that emerged from the water to become the shore pipeline on "dry" land into the marsh. The flexible, floating hose was approximately 430 m (1,420 ft) in length, allowing the dredge to work the entire width of the navigation channel. The shore pipeline terminated in a simple pipe cutoff. Sections were added as needed. The maximum pipeline length of the entire hydraulic circuit was 1,963 m (6,440 ft) (Fig. 1)

After mobilization was complete, vessel maneuvering trials were conducted before any pumping occurred to verify the *Beachbuilder's* ability to safely maneuver in, and completely out, of the channel to accommodate passing vessels. A registered Mississippi River Bar Pilot was aboard the dredge for these trials (as well as during dredging operations throughout the demonstration) to direct *Beachbuilder* maneuvers during heavy river traffic. Whenever a deeper draft vessel passed outboard the *Beachbuilder* (outboard is on the left descending bank side), the cross-channel anchor wire was dropped to allow the vessel to pass over. Figure 2 shows a large vessel navigating past the *Beachbuilder* and the floating hose. This figure also illustrates the importance of sufficient maneuverability for this type of operation. Although vessels were not supposed to pass between the *Beachbuilder* and the hard point because of the floating hose, a shrimp boat managed to do so, fortunately without significant damage to the shrimper or the discharge hose.

The dredging demonstration took place June 5-13, 2002, during some of the highest river stages experienced on the lower Mississippi in recent years, and after the dredge maneuverability was deemed sufficient by the Corps', the contractor's, and the Bar Pilot's representatives.

Figure 1. Dredge Beachbuilder *with tug astern and its floating, flexible hose configuration restoring marshland at Head of Passes. The beginning of the shore pipeline is located in the upper left-hand side of the picture by the barge-mounted crane*

Figure 2. Deep draft vessel passing Beachbuilder



Figures 3. View of marsh (a) shortly after initiating placement and (b) after dredged material placement was completed

The higher river stages provided the opportunity to test the dredge's ability to maintain position, advance, and maneuver while experiencing maximum current-induced forces on the dredge and discharge line. The maximum measured current during the demonstration period was 2 m/s (7 ft/s). Operational data collected during the demonstration included

- production meter and positioning data
- leverman logs, before and after surveys of the channel and marsh
- geotechnical samples

Once analyzed, the data and the results, along with "lessons learned" from the demonstration, will be available online at *www.wes.army.mil/el/dots/doer* as DOER technical notes or reports under the Innovative Technology subject area.

Approximately 190,000 cu m (250,000 cu yd) were placed in the marshland (Fig. 3). Marsh construction using the dustpan resulted in some "higher" above water level dredged material spots in the placement area. The New Orleans District, in cooperation with State and Federal natural resources agencies, has determined that the initial height of the dredged material cannot exceed a vertical placement height of 1.07 m (3.5 ft) Mean Lower Gulf (MLG). Grading was started less than 1 week after dredging was completed, but by that time more than 20 least tern nests (Fig. 4) were found at various locations in the placement area. Corps investigators consulted with the State of Louisiana and a decision to stop grading of the dredged material was issued in order to preclude any damage to the least terns' nests.

Results from this demonstration are expected to assist the Corps in determining the feasibility of using this dredged material placement method in future marshland restoration projects and will be addressed in a followup article in *Dredging Research*.

Figure 4. Least tern nest on newly placed dredged material for marshland restoration

Additional information is available by contacting Jim Clausner, *James.E.Clausner@erdc.usace.army.mil*, focus area manager for DOER Innovative Technologies.

Dredging Research

Vol 5, No. 4 Information from the Engineer Research and Development Center Dec. 2002

Flexible pipeline increases ship channel safety for dustpan dredge operations during marsh creation (Part 2)

Material provided by ERDC Vicksburg, New Orleans District, Louisiana Department of Natural Resources and contract personnel. Timothy L. Welp, Coastal and Hydraulics Laboratory, ERDC-Vicksburg, editor

Editor's Note: The first article under this headline presented an introductory overview of a project about the flexible-discharge dustpan dredge demonstration conducted on the lower Mississippi River during June 5-13, 2002. Part 2 reports on the research aspects of this project.

The navigation channel of the Mississippi River in the vicinity of the Head of Passes is an area where significant shoaling occurs. From mile 4.0 above to mile 1.0 below Head of Passes, the annual dredging volume averages 17,700,000 cu yd. Currently, dredging of the channel there is conducted with hopper dredges, primarily due to their mobility. Cutterhead dredges are considered a safety hazard in this area due to their inability to rapidly move out of the way of traffic. Hopper dredges move dredged material out of the channel and redeposit it somewhere else in the waterway. There is no beneficial use of the dredged material, unless it is handled again—at additional cost—to get it out of the waterway. Hopper dredges can use direct pump-out to place material in adjacent marsh but have never been used for beneficial use projects at Head of Passes due to the high cost of direct pump-out.

Modified dustpan dredges equipped with flexible-discharge piping potentially have the mobility for safe passage of traffic and can economically pump dredged material. In addition, they can pump the material at a longer distance, which is ideally suited for beneficial-use projects such as marsh construction.

Project Objectives

The Louisiana Department of Natural Resources and New Orleans District proposed a project consisting of an innovative application of existing technology. The project therefore offered a field application

Beachbuilder dustpan dredge

In this issue . . .

research opportunity under the Dredging Operations and Environmental Research Program's Innovative Technology Task Area. The three agencies decided that the demonstration project should be conducted at the head of Southwest Pass under typical river and navigation conditions that exist during spring when high water results in the greatest current velocities. A bend at the head of Southwest Pass forces traffic to "crab" across the channel for the turn. This maneuver requires more channel width. Shoals build up rapidly in this area and significant sediment is deposited along the inside of the bend. High current velocities put a strain on anchors, cables, push boats, and floating flexible-discharge hose.

The objectives developed for the demonstration project were to:

- Demonstrate safe navigation and dredging operations of the flexible-discharge dustpan dredge on the Mississippi River in the Head of Passes area. This objective was of primary importance, and if it could not be met, the project was to be terminated.
- Demonstrate sufficient production capability to dredge and place material in a designated marsh construction site and collect sufficient data to determine cost effectiveness of the technology.

Project Goals

It was determined that certain requirements were key to determining the success of the demonstration and for future implementation of the technology in the maintenance dredging program in this area. Project requirements to be met during the demonstration included:

- Dredge to a minimum depth of 60 ft below the water surface, resulting in a minimum channel depth of -51 ft Mean Low Gulf (MLG).
- Pump the dredged material up to a total distance of 15,000 ft.
- Use total length of flexible floating pipe during dredging and moving up and down, and across the channel.
- Achieve competitive dredging production rates with stoppages required for normal traffic passage.
- Maneuver into desired dredge cut both horizontally and vertically across the total channel width.
- Maneuver dredge safely to allow for normal traffic passage.
- Establish discharge pipeline across dike, adjacent pasture, and existing wetlands to designated placement point(s) with minimum possible impact on existing marsh.
- Install and operate discharge pipeline with minimal leaks in existing marsh.
- Secure discharge pipeline in current, using anchor system.
- Operate and safely maneuver discharge pipeline in the Mississippi River under typical conditions to allow for passage of both shallow-draft and deep-draft vessels.
- Pump and place dredged material so as to create a suitable marsh area with minimal impact to existing marsh.

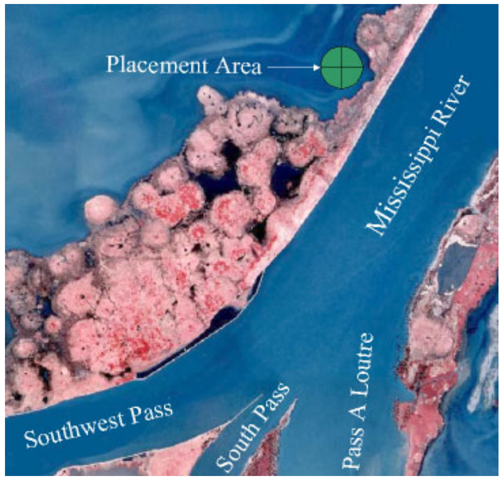


Figure 1. Head of Passes

Site Location

At Southwest Pass (Fig. 1), the channel is 750 ft wide, with a design depth of -51 ft MLG. The project area was divided into three dredging reaches. The first reach was selected as the starting location for demonstration of equipment mobility since it was located upstream of the bend where the dredging method could be tested in a less "navigationally constricted" area. The project plan specified working these different reaches in sequence to minimize downtime for moving the hard point and adding submerged pipe.

The placement area for the dredged material for the marsh creation was located on the west side of the river at Mile 1.6 above Head of Passes. The area is in open water immediately west of the channel bank revetment. The bank revetment in this area is narrow, minimizing the amount of pipe needed to reach the discharge area. A minimal amount of open water was left between the channel bank and the placed dredged material to protect existing marshland.

Site Conditions. Dredging activities coincided with the normal period of high water on the Mississippi. The stage hydrograph in Fig. 2 from the District's Venice, La., Station 01480 (located at Mile 10.7 on the Mississippi River) shows the river high/low stage cycles over last 9 years (maximum allowable number of years to plot by the analysis routine). It can be seen that the highest river stage attained during the demonstration was 4.95 ft (National Geodetic Vertical Datum). This is the highest river stage recorded since Jan. 20, 1983, when a river stage of 5.15 ft was measured. Thus, the maximum river stage measured during the demonstration confirms that the dredge was indeed tested in high water.

Currents. The average current speed measured during the project was 3.8 feet per second (fps), with a maximum speed measured of 7 fps. The high sediment load resulted in the continuous deposition of large amounts of sediment, causing rapid formation of shoals. Four hopper

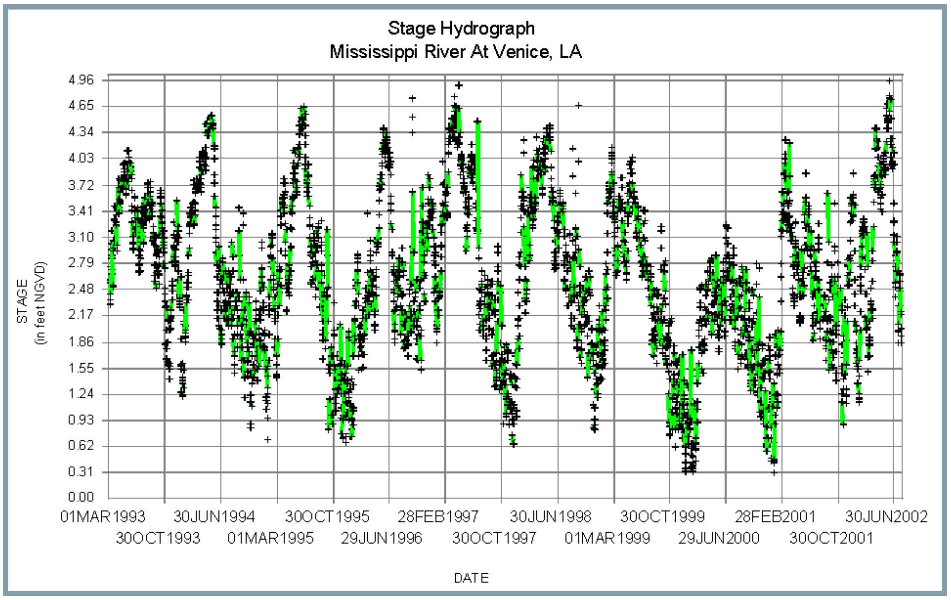


Figure 2. Venice Station stage hydrograph (March 1993 thru July 2001)

dredges were working continuously in this area to remove shoals before they could impact navigation. Shoal thickness was greatest on the inside of the bend, or Right Descending Bank, with areas approximately 20 ft thick.

Water Depth. The water depth in the placement area ranged from 4 to 6 ft. The channel bank and adjacent pasture separating the river and the placement area were approximately 900 ft wide, consisting of a rock face adjacent to the river. The remainder was a sandy soil, with a 2- to 3-ft maximum elevation above the river surface. The soil portion of the pasture was vegetated with short grass, small bushes, and marsh grass adjacent to open water on the west side.

Vessel Traffic. River traffic during the demonstration project was typical according to river pilots. Traffic averaged 20 to 25 deep-draft vessels per 24-hr period. In 6 days during the demonstration, 143 vessels with drafts greater than 20 ft passed. The traffic was not evenly spaced. Several times during the project, two deep-draft vessels passed abreast in the area of the channel where the *Beachbuilder* was working (Fig. 3).

Shallow-draft traffic consisted of tugs, shrimp boats, workboats, fishing boats, and pleasure boats. This traffic moved unimpeded both in and out of the channel during dredging operations. Outside the channel, shallow-draft traffic moved across the submerged discharge pipeline on the Right Descending Bank side of the channel. No count of shallow-draft traffic was maintained during the project.

Dustpan Dredge. The dustpan dredge *Beachbuilder* used for the demonstration project is a nonself-propelled dredge. The dredge hull is approximately 300 ft long and 75 ft wide (pictured on the cover). The maximum draft of the dredge is approximately 8.5 ft. The maximum dredging depth of the *Beachbuilder* is approximately 70 ft. The dustpan head is 40 ft wide. The ladder on the *Beachbuilder* is equipped with a submerged pump that transfers the slurry from the head to twin pumps on deck. Total pumping capability is approximately 9,000 hp (two 3,600-hp dredge pumps and an 1,800-hp ladder pump). Dredge pump discharge diameters are 30 in. The *Beachbuilder* was designed to conduct beach nourishment projects where long-distance pumping is needed.

The *Beachbuilder* normally operates using wire rope to advance into a cut. The dredge is equipped with six winches (three forward and three aft) that pull against 11,000-lb anchors to affect movement. Due to the strong current and requirement for rapid movement, a tug was connected to the stern to help propel the dredge (Fig. 4). During the project, it was determined that with the aid of the tug, the dredge could be advanced using only two forward winches with anchors set outside the Left and Right Descending Banks channel toes. Also during the

Figure 3. Ships passing abreast at the Head of Passes

project, a second tug was connected to the starboard side of the dredge to aid in movement in and out of the channel.

The *Beachbuilder* is equipped with state-of-the-art navigation, positioning, and dredge production displays that show equipment gauges, dredge position relative to the work area, dustpan-head elevation, and production parameters. Project hydrographic survey data are uploaded daily to a proprietary computer program that develops an area depth/ sediment thickness contour plot.

Flexible, Submerged, and Shore Pipeline. The discharge pipe on the *Beachbuilder* was attached to a flexible floating hose (Fig. 5) that allowed the dredge to move back and forth across the channel while continuing to operate. The hose was made up of 30-ft sections for a total length of 1,420 ft. This length of hose allowed the dredge to move across the full width of the channel and up and down the channel approximately 1,500 ft. Each section has an inside diameter of 30 in. (750 mm) and a bladder on the outside with sufficient buoyancy to float the hose when filled with dredged material. An anchor barge, or skidder, and a small tow were used to hold the floating hose in position to reduce the stress on the hose connections due to the strong current. The floating hose was connected to a "hard point" located on the Right Descending Bank side of the channel. The hard point is

Figure 4. Stern tug used to maneuver ***Beachbuilder***

an anchored floating adapter used to connect the floating hose to the submerged steel pipe. The hard point was anchored by a 10,000-lb anchor and was moved and reanchored as required to allow the dredge to work in specific reaches. In moving the hard point, steel pipe was added or subtracted to reach the new anchor point.

The steel pipe, or "submerged pipe," ran on the bottom of the river from the hard point to the dike. The total length of submerged pipe ranged from 4,320 to 7,920 ft during the project based on the hard point location. The shoreline steel pipe ran across the channel bank revetment and into the marsh-creation placement area. As the placed dredged material built up above the surface of the water in the placement area, additional shoreline was added to extend the placement further into the area (Fig. 6). Two hydraulic backhoes mounted on swamp tracks (swamp buggies) were used to move the pipe and build temporary dikes in the placement area to direct discharge flow. No other containment structures were used in the marsh-creation placement area.

Support Equipment. A variety of support equipment was used during the demonstration project. The tug *Delta Eagle* (3,000 hp) was originally connected to the stern of the *Beachbuilder* as a push boat. Due to the swift current and problems with the anchors slipping, the *Delta Eagle* was replaced by the *Delta Pacer* (4,200 hp). The *Delta Eagle* was then connected to the starboard side of the *Beachbuilder* to help maneuver the dredge in and out of the channel. The *Delta Eagle* was later replaced with the *Matthew* (3,000 hp) contractor tug. Two smaller tugs, the *Delta Fox* (900 hp) and *Delta Robin* (600 hp), were used to move several support barges, including one equipped with a 55-ton capacity crane used to lift pipe, and a small A-frame barge (or stiff-leg derrick) used to move anchors and the hard point. The tugs were also used to hold the

Figure 5. Anchor barge (skidder) holding floating hose and hard point

Figure 6. Shore pipe with marsh buggy in background

floating hose in position. A small tug, the *Marie* (300 hp), was used to ferry personnel and help move the small barges. The survey boat used was the *Sabine*.

Data Collection

The data collection program was designed to provide information for evaluating this dredging methodology's ability to meet the two primary objectives developed for the demonstration project. The various onboard-dredge, dredging prism, hydrographic, and placement area parameters monitored during the demonstration are listed in Table 1. In addition to these types of data, a survey was conducted of the Mississippi River Bar Pilots about the navigation safety aspects of operating this type of dredge on the river.

Dredging Operational Characteristics Analyses

Dredge operational characteristics analyses were conducted to determine the *Beachbuilder*'s ability to dredge and place material in a designated marsh construction site, and to provide the Corps' New Orleans District personnel with production information upon which to base cost estimates for evaluating the feasibility of using this dredging method at the Head of Passes and other sections on the Mississippi River. These analyses addressed the aspects listed in Table 2.

The dredge maneuvering characteristics were determined by calculating the respective characteristic components from data reduced from the contractor's daily dredge report and daily submittals on Engineer Form 4267, "Report of Operations - Pipeline, Dipper, or Bucket Dredges," supplemental notes taken by the Corps and contractor personnel, and time-series data of the dredge or dustpan x,y,z position, slurry density, and velocity. The production characteristics were analyzed using these types of data, in addition to the hydrographic surveys.

Production Results. During the demonstration, the *Beachbuilder* dredged approximately 222,079 cu yd of sediment (as determined by surveys in the placement area) and placed it in the designated marsh construction site. The project requirements were met, although the maximum pumping distance was 10,820 ft; the additional pipe available for the job was not required. The dredged material was pumped the total distance using the ladder pump and only one of the two deck pumps. As a result, it is assumed that a total pumping distance of 15,000 ft could be achieved. The flexible hose worked well with no leaks or breaks, even after a shrimp boat ran over it.

The average production rate of the entire demonstration between the beginning and end of dredging (192 hr) to move 222,079 cu yd was 1,157 cu yd/hr or 27,768 cu yd/day. After experimenting with maneuverability and gaining dredging experience in Reach 1, a total of 128.5 hr was spent at Reach 2 dredging 205,544 cu yd for an average production rate of 1,606 cu yd/hr (or 38,390 cu yd/day). The average production rate of the dredge while advancing was 2,346 cu yd/hr, with a maximum rate achieved of 4,559 cu yd/hr. The dredge achieved an average advance speed of 2.1 ft/min.

Maneuverability. The *Beachbuilder* demonstrated the capability to cease dredging and move from one side of the channel to the other in 11 min. The dredge achieved an average speed of 74 ft/min to back down and reset for each cut. A continuous dredging capability was demonstrated when the *Beachbuilder* was operating in the Right Descending Bank half of the channel. Single deep-draft traffic safely passed in the other half of the channel with the *Beachbuilder* dropping its cross-channel anchor wire and picking it back up after the traffic cleared. Forward movement into the cut was maintained by the push tug. Travel back into the Right Descending Bank side of the channel due to traffic was conducted if dredging operations were ongoing in the Left Descending Bank side of the channel, if two vessels passed each other in the channel abreast of the dredging area, or if the river pilot in command of the vessel requested additional clearance.

Overall Demonstration Evaluation

The flexible-discharge dustpan dredge demonstration project conducted in the Head of Passes area on the Mississippi River successfully met the project objectives. The *Beachbuilder* demonstrated safe navigation and dredging operations. The consensus of the

Table 1. Data collection parameters

Onboard *Beachbuilder*	Dredging Prism	Placement Area
Date, time Slurry pipeline velocity x,y,z, positioning of dustpan Pump vacuum Discharge pressure Production rate Slurry density USACE daily logs Daily dredging report Form 4267 daily report	River stage River surface currents Hydrographic surveys Sediment samples	Hydrographic surveys

Table 2. Dredging Operational Characteristics

Dredge Maneuvering	Dredge Production
Time interval for moving the hard point. Actual time intervals for handling anchors. Amount of delay when dredging is halted for vessel passage broken down into different locations (i.e., right or left descending banks of the channel) and different-sized vessels. Amount of time to back down and reposition for each cut. Cross-channel maneuvering capabilities (lateral maneuvering speed).	Individual advance rates per cut and average for entire project. Average bank height for each advance. Production and production rate for each advance. Average production rates.

New Orleans District personnel and the river pilots was that the dredging operation was safe with respect to traffic moving up and down the river. The June 2002 flexible-dustpan dredging demonstration project illustrated that the *Beachbuilder*, or a similar dustpan dredge, can work safely at the Head of Passes and move large volumes of dredged material out of the channel for the beneficial use of marsh creation. The dredged material can be transferred long distances by pipeline across the existing dikes and directly discharged into the marsh without need for re-handling or construction of disposal facilities. A dustpan dredge would prove most efficient at the Head of Passes, working on the Right Descending Bank side of the channel (inside of the bend) where the thickness of the sediment tends to be the greatest and the dredge can operate almost continuously while allowing passage of most deep-draft traffic.

The flexible-discharge hose allows the dredge to move across the total width of the channel but limits its movement up and down the channel based on the total length of the hose. Movement beyond this range, if only one hard point and submerged pipeline are used, requires interruption of dredging operations while the hard point is moved and submerged pipe added or removed (the use of multiple hard points/discharge lines was not investigated during the demonstration). As a result, the dustpan discharge line configuration, as used in this demonstration, is most efficient where continuous adequate shoal thickness is available and minimal movement of the hard point is required. The dustpan would not be as efficient in addressing spot shoaling over long distances up and down the channel requiring frequent movement of the hard point and associated piping. Such conditions would be more efficiently addressed using hopper dredges. The demonstration project also illustrated that a flexible-discharge dustpan and hopper dredges can work safely together in the same channel reach. A flexible-discharge dustpan dredge could effectively dredge in other reaches of the Mississippi River and in other navigation discharge configurations. In addition to maintenance dredging, the flexible-discharge dustpan dredge would be effective for use in special dredging projects (with free-flowing, relatively noncohesive material) such as construction and maintenance of sediment traps.

The complete report, currently in preparation, compares the results of the flexible-discharge dustpan demonstration to the "Assessment of Coastwide Louisiana Maintenance Dredging Capabilities Under the Federal Standard" (1998) report evaluation factors. With the conditional exception of mobility between dredging assignments and regions, the *Beachbuilder* appears to have met, or exceeded, the 1998 report evaluation requirements. The new report provides additional discussions of potential improvements for future projects. Once the report is available online, a notice will be placed in *Dredging Research*.

Additional information is available from Jim Clausner at *James.E.Clausner@erdc.usace.army.mil* and by viewing Part 1 in *Dredging Research,* Vol 5, No. 3, *http://www.wes.army.mil/el/dots/pdfs/drv5n3.pdf*

Editor's Note: The (surely eagerly) awaited second part of the article "Worm gut fluids may yield key to assessing contaminant bioaccumulation potential on dredged materials" was to report on the results of the laboratory analyses of the study introduced in Vol 5, No. 3, September 2002, *Dredging Research*. Unfortunately, the current restraints on funding did not allow that part of the research to go forward as scheduled. A decision was made to publish part two in the June 2003 issue of *Dredging Research.* Many thanks for your patience and interest in our products.

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